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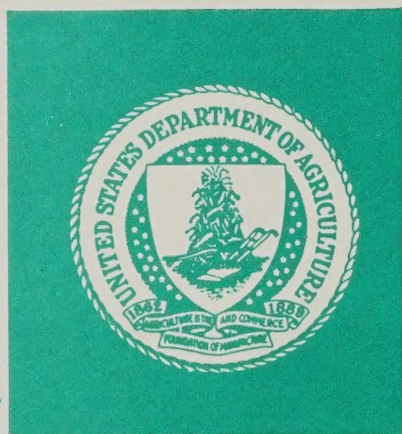
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ANALYSIS OF AND PROSPECTS FOR DEVELOPMENT OF MEXICO - U.S. COOPERATIVE  
RESEARCH AND RELATED ACTIVITIES IN BIOSYSTEMATICS OF INSECTS AND MITES AND  
BIOLOGICAL CONTROL OF PESTS BASED ON A VISIT TO MEXICO,  
19-24 September 1982

J. R. Coulson, L. Knutson, and P. M. Marsh

Insect Identification and Beneficial Insect Introduction Institute  
Agricultural Research Service, U.S. Department of Agriculture  
Beltsville, Maryland 20705

This study tour was sponsored by the Office of  
International Cooperation and Development (OICD)  
at the U.S. Department of Agriculture (USDA).  
All comments, opinions, and recommendations are  
those of the team members and not necessarily  
those of OICD, USDA, or the Mexican hosts.





## Page





## I. INTRODUCTION

For background as to the origin and purpose of this trip, see September 15, 1982 memo to P. A. Putnam (attachment No. 1). Prior to the trip, J. R. Coulson (Chief, Beneficial Insect Introduction Laboratory), L. Knutson (Chairman, Insect Identification and Beneficial Insect Introduction Institute), and P. M. Marsh (Chief, Systematic Entomology Laboratory) discussed the purpose of the trip with John D. McAlpine, Office of International Cooperation and Development (see attachment No. 2). Knutson discussed the trip with B. M. Kopacz, Assistant to the Administrator for International Activities, Science and Education and with R. L. Ridgway, National Research Program Leader, Cotton and Tobacco Insects, Plant and Natural Resource Sciences Staff, National Program Staff, ARS.

Ms. Rosie Cohen, Embassy of Mexico, Washington, D.C. and Ms. Alma Rose Lujan, U.S. Embassy, Mexico City were very helpful in arranging for many of our appointments with scientists in Mexico.

The following documents were reviewed before the trip:

1. Mexico and Its Agriculture: A Developing Market. Office of the Counselor for Agricultural Affairs, U.S. Embassy, Mexico City. June 1982. 55 pp.
2. Manual de Organizacion de la Direccion General de Sanidad Vegetal. July 1981. 71 pp.
3. IV Programa de Cooperacion Cientifica y Technica con EUA, 1981-1983. Anexo V-A. CONACYT. 28 pp + tables.
4. R. L. Ridgway. Trip Report, August 22-September 1, 1982. 14 pp.



## II. List of Contacts

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 and Institute of Ecology

P. BIOL. CAMELIA CASTILLO

BIOL. GEMMA QUINTERRO G.

INSTITUTE OF BIOLOGY  
 Universidad Nacional Autonoma Mexico  
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DR. JOSÉ SARUKHÁN  
 Director

DR. HARRY BRAILOVSKY  
 Curator of Entomology  
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DR. JAVIER R. BUTZE  
 (Syrphidae, contact of F.C. Thompson)  
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DR. LUPITA BUTZE  
 (Mealy bugs)

DR. RAUL MCGREGOR  
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MR. ROBERTO M. JOHANSEN  
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525-9060

MR. ABNER DEATHERAGE

Agricultural Attaché

DR. JEFFREY K. LUTZ

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III. Trip Report

September 20, A.M.

Knutson and Marsh visited the Museo de Historia Natural de la Ciudad de Mexico and the Instituto de Ecologia in Chapultepec Park (1/2 hour by auto from the American Embassy). We met with Biol. Pedro Reyes-Castillo and his two student-assistants, Biol. Gemma Quintero Gaona and P. Biol. Camelia Castillo. We discussed a wide range of common interests in systematics research and services, and collections. Biol. Reyes-Castillo is Sub-Director of the Museum of the Institute; he is also currently President of the Entomological Society of Mexico. "Folia Mexicana" is edited at the Instituto (see attachment No. 22). A list of the staff of the Institute is attached (attachment No. 3).

Entomologists are indicated by an asterisk, and their specialities are noted. As seen from the list of staff, the interests at the Instituto are primarily in Coleoptera, especially Passalidae, on a world basis (about 100 species in Mexico), Scarabaeidae, and Bruchidae. Biol. Reyes-Castillo emphasized that research at the Institute is on biosystematics, including behavioral, ecological, and other studies. There has been extensive cooperation with France, Italy, and other European countries, South Africa, and Australia. Recent U.S. visitors included C. W. and L. B. O'Brien (Florida) and W. F. Barr (Idaho). Currently there are researchers from France and Italy working at the Institute, and some Institute researchers are now in France. We were shown rearing facilities for Scarabaeidae and Bruchidae (constructed on site, simple but effective). The collection is small (in a first-floor, non-airconditioned room), and the major holdings are in Lepidoptera (non-specialist collections; see attachment No. 4) and Coleoptera. Representative specimens from the collections made several years ago by Agriculture Canada entomologists in El Salto, Durango, have been deposited here. Expected donations of Passalidae will be important additions. This collection was designated as a National Insect Collection by Reyes-Castillo's predecessor, Prof. Barrera (some of Barrera's material is at the National University). Insect pests, not mold, is a problem for this collection. Reyes-Castillo noted that some collections in Mexico are essentially not available to the public, and that most are small, exhibition collections.





The Instituto de Ecologia is situated with the Museo but is a separate unit that was established by the President of Mexico. The two units may be joined in the near future.

Reyes-Castillo expressed strong interest in improving cooperation in systematics, both within Mexico and with other countries. He emphasized that cooperation with other countries is valuable to Mexico in developing collections and training students. In response to our question, he said there was substantial interest among Mexican university students in systematics. Another strong interest in the Institute is environmental protection, and the development of protected areas. Reyes-Castillo is very well informed of the research stations available in many parts of Mexico (see attachment No. 5). Some of these are maintained by the Institute.

Knutson described IIBIII's recent revision of Miscellaneous Publication 601 ("Collection, Preservation and Storage of Insects") to Reyes-Castillo and asked if one or more individuals or organizations in Mexico would be interested in translating this publication into Spanish and adapting it for use in Mexico. Reyes-Castillo expressed considerable interest in this suggestion and said that the Entomological Society of Mexico would be the best place to publish this. However, only about 1,300 copies of each issue of the "Folia Mexicana" are printed. Knutson provided a copy of the draft (without figures).

Reyes-Castillo said he was interested in convening a work conference on systematic entomology and identification services at the next meeting (18<sup>th</sup>) of the Mexican Entomological Society in April, 1983. He invited Knutson to participate in that meeting (see letter and meeting announcement, attachment No. 6). We also asked if they would edit G. C. Steyskal's translation of two descriptive papers on systematic entomology in Mexico, and they agreed to do this.

We were given a brief tour of the Museum by Architect Yani Herreman (Architect). The Museum was constructed in 1965 and the evolutionary plan, beginning with a "hall of the universe" and finishing with a "hall of biogeographical regions" (which we visited) as contrasted to the





"taxonomic plan" of most natural history museums, is considered very progressive. Ms. Herreman is also the Editor of "De Museo," a new journal for museums in Mexico. She participated in a museum conference at the Smithsonian several years ago, speaking on Museum Preservation.

September 20, P.M.

Knutson and Marsh visited Abner Deatheridge, Agricultural Attaché. He gave us a succinct description of the current economic situation in Mexico, referring to agricultural trade and relating certain economic problems to pest control (i.e., citrus canker). He said that the budget cuts in Government departments in Mexico over the next few years could be very severe, and he indicated that opportunities for cooperation will be impacted. He commented that it will be particularly important to see that any cooperative research leads to solid results.

Ms. Alma Rosa Lujan, Secretary, Agricultural Attache Office, assisted us in making appointments by telephone, September 20-21.

September 21, A.M.

Joined by J. R. Coulson, we visited Dr. Jeffrey K. Lutz, Science Attaché, and discussed the purposes of our visit. Lutz has extensive contacts with environmental organizations. He noted that various U.S. and Mexican organizations which have interests in environmental studies, including faunal and floral surveys, may have interests in IIBIII basic research in systematics, and possibly with the biological control program. Lutz gave us the following:

Attachment No. 7

List of 117 projects at the Instituto de Biologia, Universidad Nacional Autonomia Mexico (see entomological projects, nos. 45-70)

Attachment No. 8

Directory of the Directors General of the Secretaria de Agricultura y Recursos Hidraulicos



## Attachment No. 9

List of acronyms for scientific organizations in Mexico

## Attachment No. 10

Mexico's Program for Science and Technology, 1978-1982 (CONACYT)  
(abridged version)

Lutz noted individuals in two organizations who probably could have interests in the IIBIII program, and cooperative research in Mexico:

1. Lic. Ricardo Mier Ayala  
Vice President, "Bioconservacion" A.C.  
Berlin No. 16A  
Mexico 6, D.F., Mexico  
Telephone: 546-8327
2. Mr. William L. Long  
Office of Food and Natural Resources  
OEA - Bureau of Oceans and International  
Environmental and Scientific Affairs, OES/ENR  
Washington, D.C.  
Telephone: 632-2418

Visit to Direccion General de Sanidad Vegetal (DGSV), SARH

We arrived at 11:00 A.M. (after making telephone appointments from the American Embassy, Agricultural Attaché's Office). We were met by Dr. Alfonso Garcia Escobar, Secretario Técnico (previously of Matamorros). We met briefly with Ing. Jorge Gutiérrez Samperio, Director General, DGSV who, after learning more of our mission, asked Dr. Felipe Romero Rosales, Sub-Director Técnico (in charge of the Subdireccion Técnico, and former student of Dr. Reece I. Sailer, University of Florida) to meet with us.

During the course of our discussions with Dr. Romero, we learned more of the organization of Sanidad Vegetal (including the five Departments of the Subdireccion Técnico), as outlined in the Manual de Organizacion





given to Dr. R. L. Ridgway during his earlier visit. When we requested a copy of this manual, it was explained to us that Sanidad Vegetal was undergoing an extensive reorganization that was not yet officially approved, and we were given a copy of the plans for this reorganization, "Elementos del Plan Nacional Fitosanitario," dated April 1981 (attachment no. 11).

Knutson presented a number of documents relating to IIBIII programs, personnel, etc., to Dr. Romero for Ing. Gutiérrez, and discussed the matter of identification of insects and mites. There were no apparent problems in this area.

Coulson then discussed the 1980 proposal for cooperation in the area of biosystematics of Trichogramma between the Beneficial Insect Introduction Laboratory (BIIL) and Sanidad Vegetal. He learned that the Department of Entomology and Acarology would be the more appropriate cooperating unit than the Department of Biological Control, as suggested in the 1980 proposal. The former Department is responsible for taxonomic research; the latter would be also involved in any cooperation, but on a peripheral basis, since their involvement with Trichogramma is in the mass culture and release area only.

Coulson also discussed the contacts between the U.S. Working Group on Biological Control of weeds and DGSV in regard to introduction of natural enemies of weeds. There seemed to be no problems in this area. Coulson noted the possible need to develop tripartite contacts (U.S.-Canada-Mexico) in this area. Dr. Romero noted the existence of NAPPO (North American Plant Protection Organization), of which he is Executive Secretary. The annual meeting of this organization, consisting of Agriculture Canada's Plant Quarantine section, USDA's APHIS-PPQ, and Mexico's DGSV, was held in New Orleans, October 12-14, 1982. Coulson was invited by Dr. Romero to attend. Coulson noted that there is a need to involve USDA's ARS [and probably Mexico's INIA] to a greater extent in the deliberations and business of NAPPO. (See also discussion below regarding biological control documentation.)



In the course of the discussion of biocontrol of weeds, both Dr. Garcia and Dr. Romero expressed interest in (and evident concern over) USDA's plans for biocontrol of mesquite. They noted the many beneficial, as well as noxious, qualities of this plant. Coulson explained that these concerns were echoed in the U.S., and that due caution was being exercised; no candidate insects were yet proposed for introduction from South America. Coulson also noted that other range weed species in the proposed biocontrol projects of Dr. C. J. DeLoach, ARS, Temple, Texas, would also be of similar interest to DGSV. He noted that Dr. DeLoach had attempted to contact DGSV in order to attend and present a paper at the 1982 National Meeting on Biological Control, but had had no response from DGSV. Coulson suggested that Dr. DeLoach contact Dr. Romero concerning his biocontrol of weeds research program, and the protocol to be used for contacting units and individuals within DGSV.

Coulson then discussed BIIL's plan for documentation of biological control importations, and gave Dr. Romero a copy of BIIL's plans. He asked to what extent DGSV was involved in the importations of natural enemies. Dr. Romero explained that most of this is done through exchange or other personal contact arrangements rather than by explorations by Mexican scientists. Coulson noted the eventual aim of involving both Canada and Mexico in a North American documentation program. Dr. Romero expressed interest in these plans, noting that he would solicit comments from Ing. Jiménez, Chief of the Department of Biological Control. He again noted that this would be an item of interest for discussion at the October, 1982 NAPPO meetings. Coulson left several publications for Ing. Gutierrez, and promised to send additional copies of Clausen's 1978 World Review of Natural Enemy Importations.

Ing. Jiménez was out of the country at the time, but arrangements were made to meet briefly with his assistant, Mr. Luis Cortes. We were given a brief tour of the facilities of the Department of Biological Control. Anastrepha and its parasites, and Musca domestica and its parasite Spalangia, were being cultured there, primarily (but not solely) for demonstration purposes.





We then spent about 1/2 hour talking with Ing. Celso Garcia Martell, Chief of the Departamento Entomologia y Acarologia. We described our interests in cooperative research, especially research on classification and identification of fruit fly larvae (especially Anastrepha and Rhagoletis). We noted that considerable rearing work would be a major part of this study, and the extensive field work would require study at various locations. There is no research planned on biosystematics of fruit flies or Trichogramma in Sanidad Vegetal. Garcia Martell noted that two staff members work on fruit flies, one of whom was scheduled to attend (but could not attend) the 21-22 September workshop on identification being given by R. H. Foote and other USDA entomologists at Brownsville, Texas.

Marsh discussed several proposed cooperative research plans in SEL involving Mexico: fruit fly larvae, Syrphidae, mealybugs, coccinellids, and Heliothis. Ing. Garcia Martell agreed that the possibilities of cooperation in the fruit fly study were good, particularly in use of DGSV facilities in other parts of Mexico.

Coulson discussed the 1980 proposal for cooperation in biosystematics of Trichogramma, as discussed earlier with Dr. Romero. Garcia Martell expressed interest in cooperating with BIIL, informally or formally, in this research program. (Similar interest in this research was expressed during the brief visit to the Department of Biological Control; it was noted that there was a need to know what species were being cultured and released, what species might be better suited for culture and release, and what species existed in Mexico.) It was agreed that as a first step, Coulson would again write to Garcia Martell to explain the Trichogramma biosystematic research program, and proposed cooperative work with DGSV in more detail.

Garcia Martell's assistant, Irene Martinez Gonzalez, gave us a brief overview of the insect collection. It consists of about 30,000 adults and 5,000 larvae. It is especially strong in Coleoptera.

During discussions at DGSV, it was learned that all correspondence to DGSV should be addressed to Gutiérrez, with a notation "Attention: Departamento...." It was explained that this was to permit the Director



General to be kept informed of all program matters within the DGSV.  
(This would explain why there has been no response to some letters in the past that have been addressed to individuals in DGSV.)

September 21, P.M.

Visited Instituto de Biología, Universidad Nacional Autónoma México (UNAM) (Dr. José Sarukhán, Janvier Butze, Lupita Butze, Raul McGregor, Harry Brailovsky). We discussed a wide range of common interests related to taxonomic research and collections. Sarukhán received a Ph.D. from the University of Wales; he is a population ecologist/botanist, but has a very strong interest in the development of taxonomic research. He recently was successful in obtaining 50 million pesos for support of taxonomic research. One objective is to establish the National Collections, in all plants and animals at the UNAM. The facilities at the Institute are extensive, rather modern (constructed in 1965), and somewhat crowded, but visiting scientists can be accommodated. If approved (by the new Government to take office in December 1982), a new building for the collections will be started in a few months. Sarukhán has a good appreciation of the need for applied taxonomy, and the development of the Instituto Biología is directed, in part, to this end. Numerous of our publications were given to Dr. Sarukhán. Harry Brailovsky will send us a complete list of their staff in the near future (Attachments 11a and b). Sarukhán expressed interest in pursuing cooperative work with IIBIII, particularly in the two areas for which there has been planning since 1979 (D. R. Miller - mealy bugs; F. C. Thompson - Syrphidae). We note that these two projects are still officially approved, but have not been forwarded. This is a well equipped research unit, and the staff are interested in cooperation in general. Most of the staff have worked in the United States or Canada in the past several years. Development of collections and taxonomists are primary interests of Sarukhan. They appeared prepared to have F. C. Thompson and D. R. Miller from the Systematic Entomology Laboratory (SEL) work with them. Living accommodations for visiting scientists would be a problem.





J. and L. Butze said Thompson and Miller could be their personal guests when they work in Mexico. There are no dormitories or hotels in the area, although a room in a private residence might be possible. There are special taxis (that travel a regular route) and buses, as well as regular taxis. A considerable amount of pre-visit time would be required to make plans for accommodations. We told Sarukhan that we would write to him in a few weeks with regard to our overall interests in working in the Instituto Biologia. Further correspondence could be directly with the UNAM scientists concerned, but copies of correspondence should be sent to Dr. Sarukhan.

Harry Brailovsky, the Curator, gave us a tour of the collection, which includes about 2 million prepared specimens, plus 1 million not mounted. This was referred to as a National Collection. Some taxonomic services are provided, but this is not well organized in Mexico. They expressed mild dissatisfaction that specimens of insects in their areas of expertise are sometimes sent to IIBIII instead of to them for identification. Knutson asked if a Directory of Mexican insect taxonomists could be prepared and distributed to help alleviate this problem. Knutson noted that the logistics involved, and the amount of communication required, to integrate Mexican-U.S. responses to identification requests are too extensive and complex to be practicable. In other words, when IIBIII receives a request for identifications from Mexico, we do not have the staff to write back to the sender, inquire if all or part of the material has been first submitted to Mexican taxonomists for identification. Such procedures, for Mexican as well as other material (including U.S. material) would require additional staff in the IIBIII Taxonomic Services Unit. We must rely primarily on (1) the users, themselves, seeking assistance first in their own country (or State in the United States), and (2) the taxonomists in Mexico (and other countries) making their capabilities known to their countrymen. Also, SEL scientists should (some do now) ask if certain material was submitted to colleagues in Mexico, and should suggest, with their identification, that the user do this in the future, as appropriate. Also, a note will be added to the enclosure on use of the IIBIII service, suggesting that users make use of local sources before sending material for identification to IIBIII.



Brailovsky expressed concern about the non-reaction of Mexican entomologists in regard to his suggestion (given in various seminars, etc.) to establish regional taxonomic identification centers. He provided a copy of a review of entomological collections in Mexico (attachment No. 12).

Plans to microfilm the scale catalog at IIBIII were described to R. McGregor.

#### Additional Comments on the Instituto de Biologia by P. M. Marsh

The Institute is a research institute within the UNAM. There are no teaching responsibilities. The Institute is divided into several Departments and Laboratories. The Entomology Laboratory is within the Department of Zoology.

1. H. Brailovsky - specific research is on Mexican Hemiptera. He has corresponded with T. J. Henry (SEL/IIBIII) and is interested in cooperative research. He mentioned that Henry "will visit" next year (Marsh did not pursue this because it is not on SEL's FY 1983 Foreign Travel Plan). Dr. Brailovsky is very interested in expanding the insect collection. He has co-authored a paper on the Mexican collections in hopes it would stimulate more Mexicans to collect and add to the collections. He is also interested in regional collections. He said he was disappointed in the response and that very few regional collections are active. He considers the UNAM collection as the National Collection in Mexico.

Brailovsky was concerned about Mexican researchers being able to get their insects identified. Apparently many people in Mexico do not know there are some taxonomic specialists at UNAM. He feels they should send material there first, and then to IIBIII, if necessary. With only a few taxonomists, however, they will definitely continue sending material to IIBIII. If a national insect identification service ever was to exist in Mexico, Brailovsky would be a prime source of advice. (See also discussion on these subjects above.)





2. Raoul McGregor - specific research is on mealybugs of Mexico. Lupita Butze is his assistant. They have been involved in a project with D. R. Miller. This project was one of the original proposals for Mexico - U.S. cooperative research and is still a viable project. Marsh did not have a chance to discuss it in detail, but Miller has suggested that McGregor (with Butze ?) visit the United States in 1983 to study the collections in Beltsville. Miller would visit Mexico in 1984, possibly in conjunction with Thompson, to collect and survey the Mexican fauna. End product would be a handbook on the mealybugs of Mexico. McGregor is anxious to continue this joint project.
3. J. R. Butze - specific research is on Syrphidae and Tachinidae. Again, there was not much time to discuss it in detail, but he is anxious to continue cooperative research with F. C. Thompson. This proposal was also on the original list of Mexico-U.S. research proposals and is still viable. The end product would be an identification manual of Mexican syrphids. Thompson states he is committed to finish the key and catalog of species. Possibly Thompson should visit Mexico in 1983 or 1984 -- if in 1984, with Miller -- to collect and study with Butze.

We met another taxonomist, Roberto M. Johansen, very briefly. He works on thrips and has corresponded with S. Nakahara. He says he is interested in cooperative research but did not talk about any specific project. (In our discussion on September 22 with Dr. Sifuentes, he said one of the groups they have a need for help with is thrips).

We took a quick tour of the collection. There are approximately 2 million specimens in what appears to be Cornell-type drawers. They are in the process of converting all the trays to foam bottom. The collection is primarily Lepidoptera and Coleoptera, but the Hemiptera is being actively added to by Brailovsky. There are only one or two drawers of Hymenoptera. The Diptera collection was upstairs, and was visited by Knutson. Brailovsky mentioned problems with getting supplies, particularly pins.



September 22, A.M.

We visited the new headquarters offices of the Instituto Nacional de Investigaciones Agrícolas (INIA), SARH. We first visited with Dr. José L. Carrillo Sanchez, and provided him with a complete set of informational handouts and discussed areas of potential cooperative research. Carrillo noted that the proposed research on fruit fly larvae should be carried out primarily in cooperation with Sanidad Vegetal (SV), although INIA fruit fly workers may be able to provide facilities, etc. He said no one in INIA is working on biosystematics of Trichogramma (this also might be best conducted in cooperation with SV). There are no plans on the part of INIA to begin work on Trichogramma biosystematics, but they agreed with the need for such work. Carrillo suggested that correspondence be sent to Dr. Rodolfo Moreno Dahme (Subdirector de Services Technicos de Apoyo), with copies to pertinent scientists.

Carrillo noted that INIA entomological work is conducted in three main geographical parts of Mexico (North, Central, and South) (see attachment No. 13). He is the entomology coordinator for the South; Sifuentes is coordinator for the Central and Northern zones (but not definitely determined as yet). Because of this arrangement, it appears that we need to communicate with both Carrillo and Sifuentes as conduits for information. Coulson said he would send Carrillo a copy of the USDA-ARS organization scheme and 12 copies of Clausen's 1978 Review. Carrillo noted that opportunity for biological control work in INIA is very limited. Carrillo indicated that it was not possible for INIA to get funds from CONACYT, and that arrangements for cooperative work with INIA not be made through CONACYT. Carrillo also provided a copy of the INIA office chart (attachment No. 14)

Marsh asked if there is a National Insect Collection in Mexico. Carrillo responded, "not really." He noted that there is a national collection for identification purposes in Sanidad Vegetal, a national collection for research at UNAM, and teaching collections at universities. Permits for collecting in Mexico should be obtained from CONACYT.





Coulson thanked Dr. Carrillo for his assistance in the 1980 Epilachna explorations by R. F. W. Schroder (BIIL/IIBIII), which had been approved in 1979 under the Mexican-U.S. exchange program. He noted that Schroder and others had submitted another proposal regarding natural enemies of and host plant resistance to Epilachna and Diabrotica beetles.

Dr. Carrillo expressed interest in this proposal, and Coulson gave him a copy of the 1982 proposal, which remained unapproved by OICD, apparently because of lack of a Mexican cooperator.

Coulson noted the need for ARS involvement, and possibly INIA involvement, in NAPP0; Dr. Carrillo agreed.

Dr. Carrillo explained the recent reorganization of INIA, along regional lines, and provided some photocopied organizational information (attachments No. 13, 14). He noted that Dr. Eduardo Alvarez Luña was no longer Director General of INIA. Dr. Jesus Moncada de la Fuente was now serving as Director General, "at least to the end of this year." (M. Carrillo explained that this position was a political one, and the Director General may be changed in December after Mexico's Presidential elections.)

We next met with Dr. Juan Antonio Sifuentes, and discussed interests in cooperative research. He feels that blind copies of letters to the Director General should not be sent to the potential collaborators. He emphasized needs in Mexico for identification of whiteflies. He said there were about 10 major groups of insects and mites where work is needed. He will confer with colleagues in INIA to determine their interests and will send us a prioritized list of areas of interest. He was not aware of any plans in Mexico to revise their publications on "Collection, Preparation,...of Specimens."

In view of Coulson's expressed interest in research on biocontrol of weeds, Dr. Sifuentes kindly made arrangements for a short visit with Dr. Omar Agundis M., INIA's Coordinator for Weed Control. Dr. Agundis gave us several publications on weeds of Mexico, and was interested in receiving publications on biocontrol of weeds and other research on weeds in the United States. He noted that Galinsoga, a weed species of



special interest to BIL, was common in this area of Mexico. Coulson discussed Dr. C. J. DeLoach's (USDA/ARS, Temple, Texas) biocontrol of weed research in Texas, and noted Dr. DeLoach's need for contacts in Mexico in regard to potential conflict of interest. Dr. Agundis agreed that his office would make an appropriate contact. (Note above and other comments regarding proper avenue of contacts with Dr. Agundis.)

Both Dr. Agundis and Dr. Carrillo indicated that contacts developed by the U.S. Working Group on Biological Control of weeds with INIA were working well and were appreciated. Dr. Agundis' wife is a plant taxonomist at the Polytechnic University. He said there is no work being done on biological control of weeds in INIA (perhaps there is none being done in Mexico).

September 23, All Day

we visited the INIA insect collection; the Laboratory of Forestry Entomology, Department of Forestry, Universidad Autonoma, Chapingo (LFE); and the Center of Entomology and Acarology, Postgraduate College (CP), at Chapingo (1 hour drive east of Mexico City).

A round table discussion was conducted from 8:30 - 11:00 A.M. with Dr. Thomas Atkinson (CP), Armando Equihua (CP), Dr. Hiram Bravo Mojica (CP), Jorge Leyra (CP), Biol. Antonio Marin (INIA), Ing. David Cibrian Tovar and Ing. Rodolfo Campos Bolaños (LFE). Atkinson has been at the Colegio de Postgraduados for 3 years, previously was with United Fruit Company in Honduras, and did a Ph.D. in insect taxonomy at the University of Florida, Gainesville. He was hired to develop an insect collection in the CP and teaches a course in insect taxonomy. Dr. Bravo completed a Ph.D. with Paul DeBach at Riverside in 1975; he teaches biological control and is Head of the Department of Entomology. A brochure on the curriculum at CP is attached (attachment No. 15). Also attached is a list of the staff and a description of the Center for Entomology and Acarology (attachment No. 16).





We discussed the broad range of opportunities for cooperation, emphasizing research on biosystematics of Trichogramma and identification of fruit fly larvae. Atkinson expressed strong interest in the Trichogramma project. Atkinson is particularly interested in SEL staff visiting to collect and work on the collection, and advise and/or work with graduate students. Atkinson's emphasis is on ecological-taxonomic studies, especially rearing studies, and biosystematics. He needs taxonomic assistance in these projects. Much information is being gained on natural enemies of bark beetles. Atkinson is especially interested in developing expertise on parasitic Hymenoptera in Mexico. He is looking for good projects for his students and assistants.

Marsh and Atkinson discussed the possibility of work on aphid parasites. This would be a good project, but perhaps would be difficult to accomplish. Marsh described the general interests of SEL scientists in the insects of Mexico, and several possibilities for cooperation emerged; e.g., sawflies, scale parasites, and parasites of certain ecological groups of insect pests. Knutson suggested that Atkinson and Cibrian visit IIBIII and give a seminar on their programs to further determine possibilities for cooperative work, and interests of IIBIII scientists. There is no cooperative agreement between CP and any U.S. university involving entomology at present.

Marsh discussed at length the organization of the Parasitic Hymenoptera Training Session and the possibility of giving the course in Mexico. Atkinson said he could guarantee a "full house", and that it would be extremely valuable to Mexican entomology. Details will be worked out between Atkinson and Marsh. Funding for expenses of L. Masner and H. K. Townes may be a problem. Funds for Marsh, Menke, and Grissell will be requested from the Office of International Cooperation and Development.

Coulson described the BIIL program. Atkinson was most interested in the possibility of developing a cooperative project on some portion of BIIL's Trichogramma biosystematics program that could lead to a M.S. degree. He has a potential candidate for this project. Coulson promised to send more details as to what type of project might be



developed. There would also seem to be good opportunity for cooperative work on natural enemies of the weed Galinsoga. Atkinson has three of his assistants working on studies of the insects closely associated with groups of weeds, especially weeds related to crops. They are collecting only the insects and mites having trophic relationships with the plants. Part of the objective of this work is to obtain material for the collection. Galinsoga is not one of their current study plants, although it apparently occurs in the area. Coulson will send Atkinson a copy of the forms used in capturing release data and of the BIIL documentation plans, and will send Bravo copies of the Clausen 1978 Review.

There are insect collections at Chapingo in INIA, CP, and the Laboratory of Forest Entomology.

A Cooperative Agreement between INIF, the School of Forestry, and Sanidad Vegetal has been established, in part, to develop a fourth collection, a collection of forest insects. Atkinson has developed a system for capturing label data and storing it in the IBM mainframe computer at Chapingo. If they cannot unite the three or four collections (a long-term goal), they will at least be able to combine the information in a database. None of the collections at Chapingo have difficulty in obtaining pins. Atkinson commented on the lack of species identifications of Chrysomelidae provided by IIBIII. Atkinson asked for information on humidity-proof insect storage cabinets. He mentioned the "Manual for Tropical Herbaria" as a useful publication.

We next visited the INIA collection, José Marin Jarillo, Curator. Marin is working on an M.S. degree (on Coccinellidae) with José Carrillo S. The collection was started in 1948 by Dr. Carrillo and W. Gibson. Lists of the collection have been published (see attachment No. 17). Much material is sent to specialists in various organizations for determination. Annually, about 7,000 - 10,000 specimens (80 lots) are received from INIA researchers for identification. About 1,500 of these can be identified by Marin. There are four technicians working on the INIA collection. The main difficulty is a lack of taxonomically trained personnel. The INIA collection consists of 80,000 specimens (primarily





of agricultural importance). Well-represented groups include Cicadellidae, Scarabaeidae, Coccinellidae, Carabidae, Chrysomelidae, Curculionidae, and Tachinidae. Because little of the Chrysomelidae material is authoritatively identified to species, there is little opportunity for exchange with IIBIII.

We also visited the Forest Entomology Laboratory (FEL), Department of Forestry, Universidad Autonomia, Chapingo. The insect collection of FEL is not a general or reference collection, but consists of material obtained as a part of the projects (similar to the ARS overseas biocontrol laboratory collections). In order to develop cooperation with FEL, it would be very useful to send Cibrian a list of SEL projects and areas of interest in forest insects. R. J. Gagné and D. C. Ferguson (SEL/IIBIII) may be appropriate cooperators. Ing. Cibrian cooperates extensively with USDA, Forest Service, entomologists; Bernard Ebel (USDA/FS) will be conducting some surveys with Cibrian in the near future. The main emphases of FEL are seed and cone pests, Nantucket pine and other tip moths, and bark beetles. Coulson offered to send Cibrian literature on parasites of Nantucket pine tip moth. This species has recently become established in Costa Rica and Costa Rican entomologists are searching for parasites in Mexico. Cibrian provided Knutson with a fine collection of 100 specimens each of five forest pests (attachment No. 18). Cibrian also provided copies of a list of 62 Mexican forest entomologists (attachment No. 19). Copies will be sent to M. W. McFadden (USDA/FS). We also obtained a copy of the First National Symposium on Forest Pests.

Knutson mentioned his discussion with Pedro Reyes-Castillo about MP 601 to Dr. Bravo. (Bravo will be the President of the Entomological Society of Mexico next year.) He indicated interest, but noted that funds for publication were limited. Knutson will send a copy of MP 601 to Bravo.



September 24, A.M.

We visited the offices of Servicio Tecnico, INIA. Dr. Carrillo had made arrangements for us to meet at 9:00 A.M. with Dr. Rodolfo Moreno D., Sub-Director of INIA's Technical Services, and with Ing. Eduardo Simon G., Chief of the Services Departamento de Convenias Interinstitucionales (which in some respects corresponds to OICD).

Dr. Moreno explained the INIA organization and certain recent problems (financial/budgetary). INIA, which he noted corresponded to ARS, had 54 agricultural research stations organized under 11 regional agricultural investigation centers. There are more than 1200 research workers in INIA. There is little opportunity for graduate training outside Chapingo and Ciudad Obregon. There is an on-going effort being made to upgrade the INIA research staff by increasing the numbers of postgraduates, especially M.S. students. (There are currently about 50 Ph.D.'s.). Some Ph.D.'s are being given in Mexico in soils and plant breeding. Dr. Moreno noted that INIA was particularly poor in the area of insect taxonomy, and thanked Knutson for the assistance received by INIA from IIBIII in insect identification. An organizational brochure was presented to us (Attachment No. 20). As noted in earlier discussions with Dr. Carrillo and Ing. Sifuentes, INIA had recently been "regionalized," but Dr. Moreno made the point that strong centralized direction was still needed. Ninety percent of the staff has been outside Mexico D.F. since the reorganization (decentralization) of a few years ago. This was the reason that persons like Dr. Carrillo and Ing. Sifuentes, with their knowledge of national rather than regional needs, were so important in the organization of INIA.

The central offices of INIA moved from Chapingo to Mexico City in 1976, and this year (1982) has been split into two buildings due to an expansion of staff.





Knutson explained our mission, stressing three potential cooperative projects, for which Mexican collaborators had not yet been identified:

1. Taxonomy of fruit fly larvae
2. Taxonomy of Heliothis
3. Biosystematics of Trichogramma

It was noted that Dr. Ramirez was the representative from Mexico to the Las Cruces meeting on Mexico - U.S. cooperative research. Coulson also mentioned the 1980 proposal regarding natural enemies of and host plant resistance to Diabrotica and Epilachna beetles, a copy of which had been given to Dr. Carrillo earlier. He noted that a greater degree of mutual benefits than had occurred in the 1980 project regarding Epilachna was desirable. No CONACYT funds were made available for Mexican assistance in this project. (Dr. Carrillo later noted that benefits to Mexico had indeed occurred in the form of increased knowledge on the Mexican distribution of a natural enemy of Epilachna.) Dr. Carrillo, who joined the meeting later, indicated that there may be interest within INIA in cooperative projects on fruit fly larvae and Heliothis, but not in Trichogramma. INIA could participate in the survey, but not the rearing work. Knutson noted that 1-2-page proposals would be sent to INIA with some details of these proposals, a procedure agreeable to Dr. Moreno et al. Moreno asked if there was some umbrella agreement under which INIA work with IIBIII would fit. It was noted that correspondence should be directed to INIA's Director General, with copies to Dr. Moreno, Dr. Carrillo, and Ing. Sifuentes; this was suggested by Dr. Moreno as the best arrangement to get information to all those concerned. He indicated information on other U.S.-Mexican entomological cooperative projects, not INIA-related, that were developed as a result of our trip would be appreciated in his office. He also noted that CONACYT was scheduled to meet in September; they were supposed to have met in July.



IV. LIST OF ATTACHMENTS\*

1. Memo, L. Knutson to P. A. Putnam, 15 Sept. 1982
2. Memo, L. Knutson to J. D. McAlpine, 8 Sept. 1982
- 2a. "Las Publicaciones de la Sociedad Mexicana de Entomologia: Pasado, Presente y Futuro" - P. Reyes Castillo. 1978. Folia Entomol. Mex. 39-40:235-246
3. Personal Cientifico - Instituto de Ecologia, Mexico D.F.
4. "La Coleccion Müller de Lepidoptera en el Museo de Historia Natural de la Ciudad de Mexico" - Díaz Batres, M. E., and A. Barrera. 1981. Folia Entomol. Mex. 49:35-40
5. "Museos, Colecciones Cientificas y la Conservacion del Germoplasma." 1980. Folia Entomol. Mex. 46:1-64
6. Letter, P. Reyes-Castillo to L. Knutson, 14 Sept. 1982
7. List of 117 projects at the Instituto Biologia, UNAM
8. Directory of Directors of Secretaria de Agricultura y Recursos Hidraulicos
9. Acronyms of scientific organizations in Mexico
10. "Mexico's Program for Science and Technology, 1978-1982" (abridged version) Consejo Nacional de Ciencia y Tecnologia (1978)
11. "Elementos Para Un Plan Nacional Fitosanitaria" - Direccion General de Sanidad Vegetal, Secretaria de Agricultura y Recursos Hidraulicos - 1981
- 11a. List of Researchers, Institute of Biology, UNAM
- 11b. List of Technicians, Institute of Biology, UNAM
12. "Estado Actual de las Colecciones Entomologicas de Mexico" - Reyes-Castillo, P. and H. Brailovsky. XVI. Congreso Nacional de Entomologia, 6-7 April, 1981
13. Geographical divisions of Instituto Nacional Investigaciones Agricola (INIA)
14. INIA staff chart
15. "Informacion para Estudios de Postgrado - 1982, Colegio de Postgraduados - Chapingo"
16. Chapingo - list of staff and description of the Center for Entomology and Acarology

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\*Attachments available upon request from L. Knutson.





17. "Lista de Insectos en la Coleccion Entomologica del Instituto Nacional de Investigaciones Agricolas" - 1976. Domingues R., Y. and J. L. Carillo S. Instituto Nacional Investigaciones Agricola Fol. Misc. No. 29, 245 pp.
18. Mexican forest pest specimens received from Biol. D. Cibrian Tovar
19. List of Mexican forest entomologists - provided by D. Cibrian Tovar, Sept. 1982
20. INIA organizational brochure, "Estos es el INIA" - 1981
21. Research Proposals







